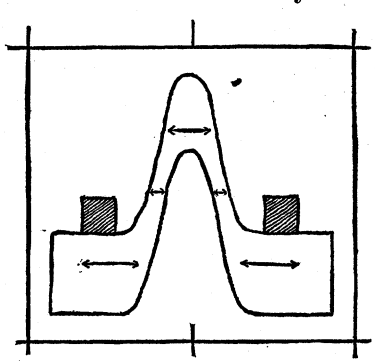
doubtless the illumination and color of water are frequently due to combined causes.

THE PLASTICITY OF ICE CRYSTALS.

Dr. O. Mügge has recently published the account* of a series of experiments on he deformation of ice relative to its crystalline structure. McConnel's experiments have shown that permanent deformation by *bending* may be induced in an ice slab only when the pressure acts in the direction of the optic axis; the optic axis remains normal to the curved basal surface after bending.

Mügge shows that plastic translation without bending is possible only in a plane perpendicular to the optic axis. To the middle of a small bar of ice placed across two supports, the latter as near together as possible, a heavy weight was attached by a strap. The optic axis lay horizontal. A portion of the ice, about as wide as the strap, was gradually drawn down until completely detached. (See figure.) The temperature remained below freezing. The stretched portions were optically oriented exactly like the main bar, the axis lying everywhere horizontal as indicated by the arrows.



The plane of the base was determined to be the only plane in which such translation could be induced; pressure oblique to a basal slab was found to produce torsion that tended to bring the optic axis into coincidence with the direction of pressure.

These experiments prove that plastic deformation and flexibility are important components of the movement of glaciers. The parallel position of the optic axes of associated 'Körner,' or glacial granules, has been observed, at least locally; this is undoubtedly due to the fact that by translation on planes parallel to the base and simultaneous bending, the optic axis is forced into parallelism with the direction of pressure. Observations on plates of ice cut from the Aletsch Glacier show that where its bed sharply slopes, the optic axis lies at right angles to the lower surface of the ice. It is probable also that the increased purity of the ice at a glacier's lower extremity is due to the gradual liberation of 'air bubbles' in migration along definite planes.

T. A. Jaggar, Jr.

Cambridge, Mass.

*Neues Jahrbuch für Min., Geol. und Pal., 1895, Bd. II., Heft 3, p. 212.

NOTES UPON AGRICULTURE AND HORTICULTURE.

THE POTATO SCAB.

Several Experiment Stations are making tests of various remedies for the potato scab. This trouble of the potato is due to a fungus closely related to the bacteria.

Bulletin No. 33 of the Rhode Island Station gives a somewhat lengthy report of experiments that cover three years with various chemicals. Dr. Wheeler and Mr. Tucker, the authors, state that air slaked lime, wood ashes and calcium carbonate, calcium acetate and oxalate all increase the scab; while calcium chloride prevents it, but likewise injures the potato plant. Calcium sulphate (land plaster) is the only form of lime not harmful to the potato which fails to increase the scab. Common salt reduces the amount of scab, and this explains why sea weed is healthful to potato land when used for manure. Barnyard

manure increases the scab, probably because alkaline. On the other hand, oxalic acid tends to reduce the scab. It is thought that anything which reduces the acidity of the soil will increase the scab. The scab fungus seems to multiply in the soil when the potato crop is not present. Upon acid soils practical immunity from scab has been secured for three years. Upon acid land potatoes free from scab may be grown if no barnyard manure is used.

CHERRIES.

UNDER the above short title Prof. Bailey and Mr. Powell have prepared a bulletin (No. 98 Cornell University Experiment Station), giving among other things the classification of cherries under the horticultural groups; namely sours, amarelles and morellos, sweets, mazzards, hearts, begarreaus and dukes, and then the botanical grouping. There are two species, namely, *Prunus cerasus* L., the sour cherries, and *P. avium* L., the sweet cherries, with three well-marked varieties under the latter species.

Cherry growing is a neglected industry. The tree likes a rich loamy soil with frequent cultivation. The worst enemy is the curculio, and jarring the trees will save many cherries. For the rot spraying with Bordeaux is recommended. The bulletin is illustrated with several engravings of fruits made from photographs of subjects natural size.

CURRANTS.

NEW YORK STATE can boast of two Experiment Stations, one, the older, at Geneva, and the other at Ithaca. Both have their number of issues in the nineties, while, for example, No. 98 of the Cornell University Station is upon cherries, briefly mentioned in the previous paragraph, the No. 95 of the New York Station deals with currants. Prof. Beach, in this, informs the readers that the testing of varieties of currants began at Geneva in 1882 with eleven sorts. Now there are forty under study and this exclusive of seedlings. It is shown that of the red sorts the Prince Albert is the largest bearer, it averaging nearly nine pounds per plant. The White Dutch is the most productive of the white sorts. But it seems from the bulletin that quantity is not everything, for healthfulness of bush, shipping quality and flavor of the berry must all be considered. One sort may be too watery for profitable jelly making or have a skin too thick for jam, etc. The reader of these bulletins upon fruits is led to imagine that the stationists practice all the phases of the culinary art in order to pass judgment upon their subjects.

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CURRENT NOTES ON ANTHROPOLOGY.

SOUTH AMERICAN LINGUISTICS.

DR. RODOLFO LENZ continues his valuable contributions to the study of the Araucanian stock by the publication of a series of dialogues in the Picunche dialect. His presentation and analysis are fully up to the requirements of modern scientific linguistics. His article appears in the 91st volume of the 'Anales de la Universidad de Chile.'

The tireless student of the Argentinian languages, Samuel A. Lafone Quevedo, publishes in the 16th volume of the 'Boletin del Instituto Geographico Argentino' an essay of over forty pages on the Vilela or Chulupi language of the Chaco. His material is mainly from the works of Hervas, Adelung and Pelleschi. The results he reaches confirm the statement of affinities between the Lule and Vilela tongues which I advanced in my 'American Race,' p. 313 (1891). That these related dialects should be classed with the Pacific or Andean tongues on account of their suffix formations and personal pronouns, is not yet sufficiently demonstrated.